A convergence of research has established that attention-deficit/hyperactivity disorder (ADHD) is a valid clinical syndrome affecting individuals of all ages. ADHD is associated with significant impairment in many important life domains that often requires clinical intervention. Although medications are a well-researched and effective first-line treatment option, many adult patients with ADHD continue to experience significant functional impairment despite the symptom improvement afforded by pharmacotherapy. Consequently, adjunctive psychosocial treatments often are indicated for adults with ADHD. The aim of this paper is to review the status of cognitive-behavioral therapy (CBT) as an effective psychosocial treatment (when combined with pharmacotherapy) for adult ADHD. This review includes a brief discussion of the CBT conceptualization of ADHD, a summary of clinical outcome studies of psychosocial treatments for adult ADHD, directions for future research, and a discussion of the various possible mechanisms of change involved in CBT for adult ADHD.

Introduction
Attention-deficit/hyperactivity disorder (ADHD) is a valid developmental neurobehavioral syndrome that has been found to affect individuals of all ages [1–4]. Its hallmark symptoms—developmentally inappropriate levels of inattention, hyperactivity, and impulsivity—stem from genetic and neurobiological underpinnings and first appear in childhood or adolescence [5••,6]. Although there is no “late onset” of ADHD, many individuals may not experience clinically significant impairment associated with their symptoms until late adolescence or when facing the increased demands of adult life at college or in the workplace.

The prevalence of ADHD among childhood samples generally has fallen in the range of 3% to 7%, translating to approximately 2 to 5 million school-aged children in the United States [1,7]. Similar prevalence rates have been obtained from international samples, although there is variability in some studies resulting from the use of diverse diagnostic criteria and cultural differences in defining what behaviors constitute “symptoms” [8–10].

The comforting bromide that children with ADHD will eventually “grow out of it” has not been supported by research. Results from longitudinal studies indicate that at least one half and upward of 90% of children with ADHD will continue to have clinically significant symptoms, if not the full syndrome, as adults [11–13]. A recent survey of adults in the United States reported that 36.3% of the sample that reported fulfilling diagnostic criteria for ADHD in childhood continued to meet full diagnostic criteria as adults [14]. The researchers noted that this percentage is likely an underestimation of actual clinical persistence, as existing diagnostic criteria do not adequately describe the symptom profiles experienced by adults [15]. An empirically derived symptom list for adults with ADHD that reliably distinguishes this clinical group from a sample of non-ADHD clinical controls and a community control sample recently has been published; this sets the stage for inclusion of adult-specific criteria for ADHD in the DSM-V [16••].

Research on ADHD prevalence among adults established the commonly cited prevalence rate at approximately 4% of the adult population, with the results of a recent national survey in the United States indicating that 4.4% of adults fulfilled diagnostic criteria for ADHD, or approximately 8 million American adults [8,17,18,19••,20]. Despite experiencing increasing diffi-
difficulties related to their symptoms, many individuals with ADHD do not seek assessment and treatment until they face undeniable functional impairment in some aspect of their adult lives, with a recent survey indicating that 35% of adults with ADHD were not diagnosed until after age 18 years [21•]. In fact, recent evidence suggests that the age-of-onset requirement for the diagnosis be raised from 7 years to 16 years [16••].

Regardless of when ADHD-related difficulties are encountered, recent research indicates that the impairment experienced by affected individuals can be quite severe. When compared with nonclinical controls, individuals with ADHD complete fewer years of education; have lower occupational attainment; receive lower job performance ratings; change jobs more frequently; are at increased risk for comorbid mood, anxiety, and substance use problems; have poorer driving records; incur higher health care costs; are at greater risk for teen pregnancy and contracting sexually transmitted diseases; have higher divorce rates; and have greater rates of emotional maladjustment, including more pessimistic views of themselves, their childhood experiences, and their future prospects [21•,22,23•,24]. These findings are not presented to imply that college degrees and high salaries are requisites for adaptive functioning and positive well-being, but rather to illustrate that ADHD is a disorder that can cause significant impairment and may interfere with many reasonable life pursuits for affected individuals. Unfortunately, less than 20% of adults with ADHD receive specialized care despite the availability of effective treatments [19••].

**Treatments for Adult ADHD**

Medications, particularly psychostimulants, have proven to be an effective treatment for ADHD’s core symptoms for patients of all ages [25–27]. Many adult patients with relatively mild and uncomplicated cases of ADHD may respond very well to treatment with medications alone.

Whereas medications are effective in reducing core symptoms, symptom improvement does not necessarily result in improved academic, vocational, or relationship functioning for many individuals with ADHD. Considering the prevalence of psychiatric comorbidity and functional problems experienced by adults with ADHD, many patients seek additional psychosocial treatment for help managing these issues.

However, until relatively recently, no empirical guidance with regard to selection of appropriate psychosocial interventions for adult ADHD had existed. Psychosocial approaches were adapted from traditional models of psychotherapy and derived from anecdotal accounts of what could be helpful for patients with ADHD [28]. It was generally accepted that unstructured, free associative therapy approaches and traditional formulations of poor follow-through as “resistance” were not beneficial for most adults with ADHD. Instead, it was thought that psychosocial treatment for adult ADHD would require more structured agendas, including redirecting patients when needed, a focus on coping skill development, and problem management related to specific functional difficulties. In fact, an early treatment study of previously misdiagnosed adult patients with ADHD found that a combination of medications and therapy focused on psychoeducation and coping skills resulted in clinical improvements [29].

Cognitive-behavioral therapy (CBT)-oriented approaches were appealing options for treating adult ADHD because this model of psychotherapy already employed structured agendas; a collaborative, problem-solving focus; and the emphasis on between-session “homework” to institute the behavior and cognitive modification and skill-building strategies discussed in sessions [30]. Thus, it was not difficult to adapt these approaches to address the unique needs of adults with ADHD.

**CBT Approaches for Adult ADHD**

Several somewhat different CBT-oriented approaches for adult ADHD have been studied, with some delivered in group settings [31–33], some designed for individual sessions [34–36], one emphasizing self-directed treatment [37], and some approaches focused on specific treatment modules or executive functioning skills [38•,39,40]. Despite these variations, CBT approaches share an acknowledgment of the neurobiological underpinnings of ADHD. That is to point out that ADHD is not the result of faulty or distorted thinking. Although a clear-cut pathophysiology for ADHD has not yet emerged, owing to the likelihood that there may be multiple developmental pathways, neurobiological and neuropsychological inefficiencies result in the downstream observable problems related to cognitive and behavioral self-control [5••,6].

That being noted, living with ADHD, particularly when it has gone undiagnosed until adulthood, may lead to the development of an assortment of maladaptive cognitive and behavioral patterns that further interfere with effective coping and problem management. In particular, there may be a system of self-defeating core beliefs and behavior patterns stemming from past difficulties and setbacks associated with ADHD [41]. These patterns also may contribute to the development and/or maintenance of comorbid psychiatric problems.

Although treatment goals are often formulated in terms of specific behavioral objectives, the cognitive modification component of CBT for adult ADHD is an important one. In addition to executive dysfunction contributing to difficulties with various aspects of self-management, such as getting started on tasks, maintaining concentration, and being organized, adults with ADHD often have developed pessimistic outlooks about themselves. These outlooks result in negative assumptions about their abilities to manage their affairs. In many cases, these thoughts are not completely distorted, because individuals with